

IMAGE PROCESSING APPARATUS

The present invention relates to the recording of images of an object and the processing of the image data to determine the position and orientation at which the images were recorded, to generate data defining a three-dimensional (3D) computer model of the object, and to display images of the 3D computer model.

3D computer models of objects are useful for many applications. In particular, there is now a growing demand from members of the public to have 3D computer models of objects for uses such as the embellishment of internet sites, etc. In addition, with the growing popularity of internet sales, especially internet auctions, the use of a 3D computer model of an article provides greater opportunity for a potential purchaser to inspect the article in detail than a number of fixed images of the article, because the potential purchaser can view the 3D computer model from any number of different chosen positions and orientations.

The inventor in the present case has found, however, that the generation of a 3D computer model and subsequent display of images thereof suffers from a number of

problems.

In particular, the inventor has realised that, when images of a 3D computer model are displayed, the first image displayed is typically not the best image of the modelled object for the intended purpose. For example, this can be a particular problem for applications such as internet sales because a potential purchaser will often inspect a large number of articles before deciding on a purchase and will spend only a small amount of time inspecting each individual article. Accordingly, in this situation, the first image of the 3D computer model should show a view of the object (usually the front of the object) which best presents the object and causes the viewer to inspect the object further (by specifying different viewpoints and view directions to generate further images of the 3D computer model of the object). However, the seller or owner of the object has no control over what the first image shows.

The first image of a 3D computer model which is displayed becomes more important if the viewer cannot subsequently define a new viewing position and/or direction, for example because of limited processing capability, or if it is difficult and/or time consuming for the viewer to

define a new viewing position and/or direction, for example because of limited user interface features.

It is an object of the present invention to address this problem.

In particular, it is an object of one aspect of the present invention to enable a user to determine what the first image of a 3D computer model of an object will show by the way in which the object is imaged in order to generate image data from which the 3D computer model is produced.

According to the present invention, a 3D computer model of a subject object is generated from images of the subject object. A user is provided with a calibration pattern and information specifying a position or direction relative to the pattern on which the viewing direction for the first image of the 3D computer model will be based. Accordingly, knowing the viewing direction of the first camera the user can orientate the subject object relative to the calibration pattern so that the desired part of the subject object appears in the first image. In subsequent processing, the recorded images are processed to generate data defining the 3D